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NOTES ON THE CLAYTON HERBARIUM.

S. F. BLAKE.

ONE of the earliest works on the flora of the United States was Gronovius's *Flora Virginica*, the first edition of which was published at Leyden in two parts in 1739 and 1743, the second in 1763. Worked out at Leyden with Linnaeus's assistance in the 1730's, from the series of specimens sent to Gronovius by John Clayton,¹ clerk of Gloucester County, Virginia, it is of extreme importance as affording the chief basis of perhaps the greater number of North American plants published in the *Species Plantarum*. Although Clayton's herbarium, now incorporated in the general collection of the British Museum, has been frequently consulted by American workers, especially by Dr. Gray, no systematic examination of the whole collection appears to have been made, at least in recent years. While working at the British Museum in 1914 and 1915 I had an opportunity through the kindness of Dr. A. B. Rendle of making a careful study of the whole collection, and the rather numerous changes in nomenclature necessitated by the reidentification of Clayton's specimens are here brought together.

The interpretation of Linnaean names based on several prelinnaean references representing more than one modern species has always been a matter of difficulty, and has often led to serious differences of opinion. The uncertainty often attending the attempt to unravel the confused tangle presented by the Linnaean synonymy has in some cases led authors to cut the Gordian knot by arbitrarily typifying the Linnaean species by the specimens in the Linnaean Herbarium. It

¹ See Britten, Journ. Bot. xlvi. 297-301 (1909), for an interesting account of Clayton.

is or should be well known, however, that the specimens in the Linnaean Herbarium are not types in the modern sense (except in rare cases, when Linnaeus's species were based entirely on specimens in his herbarium at the time of publication), and their identity is often only of minor significance. It was Linnaeus's practice to add at any time specimens which he considered to represent species described in the *Species Plantarum* or other works, which has in the past been a source of some confusion to botanists who have examined his herbarium. Through the careful studies of Mr. B. Daydon Jackson,¹ now fortunately accessible to all, it is possible to learn the date of accession of all specimens in the Linnaean Herbarium, and thus to estimate their value as representatives of the Linnaean species.

Too much stress has been laid, especially by modern geneticists, on an assumed fundamental difference between Linnaean and modern ideas of species. The Linnaean species, properly considered, was not a mere aggregation of more or less closely related entities, but in its essentials identical with the specific units of the great majority of reputable botanists since his time. Composite and sometimes hopelessly confused species he had, but they were due in great part to the fact that his material was so largely merely bibliographical, and even modern botanists have sometimes based new specific names on specimens in hand which when examined by other workers have been found to represent not merely two or more species but sometimes even distinct genera. The gradual tightening of specific lines, from Linnaeus's day to our own, has been due in the main not to an alteration of ideas but to more careful study of better and more abundant material, and to the discovery of constant and significant differences in the smaller and less obvious structures of the plant formerly little attended to. The conflict in the specific ideal comes not between that of Linnaeus and that of the modern systematist, but between the latter and that of the geneticist, and its settlement must be left to the future.

If then the Linnaean species, when an aggregate, differs in no essential from any modern aggregate species, how is it to be typified? Only in exceptional cases can the Linnaean Herbarium solve the question. The "first citation" method, although it may sometimes be of service, is surely not to be adopted as an arbitrary rule. The principle of the "name-bringing synonym," likewise, though often useful, is by

¹ B. D. Jackson, "Index to the Linnean Herbarium," Proc. Linn. Soc. 124th Sess. Suppl. 1-152 (1912).

no means so clear or so significant in its application to prelinnaean synonymy as it has been found to be in the case of modern binomials, and should not be too hastily resorted to. When a prelinnaean polynomial has been wholly or largely adopted by Linnaeus for his diagnostic phrase (the "nomen specificum" of Linnaeus, whose "nomen triviale" has become our modern "specific name"), the plant so honored should certainly be considered as entitled to the restricted Linnaean name, unless some valid objection to this course can be presented. In many and perhaps most cases, however, the application of Linnaean names must be determined by the action of subsequent authors, and here choice must be made between two courses, different in their methods but sometimes leading to the same end. By what may be called the process of *unconscious elimination*,—through the creation of new specific names for units involved in a given Linnaean species by subsequent authors, without reference to or (so far as is shown by published notice) knowledge of their connection with that Linnaean species,—the latter may eventually be reduced to a single entity to which the name might be restricted. On the other hand, an author with a knowledge of the several entities constituting a Linnaean species as originally described may, even after the more or less complete dissection of a Linnaean species in the manner just described, restrict it to some one of its original components, perhaps already named, and assign a new name to that portion of it to which, by the first method of procedure, the Linnaean name would be restricted. This second method, which by the way is the one now adopted by ornithologists for the determination of generic types, seems the soundest that can be adopted. It is scarcely necessary to add that such further use of this power of subsequent designation of the type as may be necessary should not be arbitrary, but should where possible incorporate the established work of previous authors who have not been guided by this principle.

1. *Scirpus capitatus* L. Sp. i. 48 (1753).¹ From the subjoined Linnaean diagnosis it will be seen that this species was based almost entirely on the Gronovian reference, which in turn is based on *Clayton* 380, now in the British Museum. This specimen is the plant now

¹ *Scirpus capitatus*.

"5. SCIRPUS culmo tereti nudo setiformi, spica subglobosa.

"*Scirpus culmo setaceo nudo, spica subglobosa. Gron. virg. 12.*

"*Habitat in Virginia.*"

known as *Eleocharis tenuis* (Willd.) Schultes, with which it has previously been identified by Gray and C. B. Clarke, although no published record has been made. In the Linnaean Herbarium are two sheets representing *S. capitatus*: 1st., a sheet of the plant now known as *Eleocharis capitata*, received from Patrick Browne in 1758, and consequently of no importance in fixing the type of the species; 2nd., a sheet of *E. obtusa* (Willd.) Schultes, collected by Kalm and known to Linnaeus before 1753. As the description in the Species Plantarum refers mainly to the Clayton specimen, it is necessary to regard this as the type of the species, the Patrick Browne specimen being, as already noted, of no consequence in this connection since it was not known to Linnaeus before 1758. It therefore becomes necessary to adopt for the widely distributed tropical and subtropical species that has been called *Eleocharis capitata* the name ELEOCHARIS **caribaea** (Rottb.) Blake, based on *Scirpus caribaeus* Rottb. Deser. Pl. Rar. Progr. 24 (1772); Deser. Ic. Nov. Pl. ed. 1. 46. t. 24 (1772); ed. 2. l. c (1786). The variety with purplish-brown scales and purplish-black achenes, localized at the southern end of Lake Michigan, becomes E. CARIBAEA var. **dispar** (E. J. Hill) Blake (*E. dispar* E. J. Hill, Bot. Gaz. vii. 3 (1882); *E. capitata* var. *dispar* (E. J. Hill) Fernald, RHODORA viii. 126 (1906).

The name *Eleocharis capitata* (L.) R. Br., Prod. Fl. Nov. Holl. i. 225 (1810), has a somewhat peculiar status. It was based on "Scirpus capitatus Linn. sp. pl. ed. Willd. 1. p. 294," but was expressly distinguished from the Gronovian plant, which of course Brown had examined, type of *S. capitatus* L. Since however Willdenow's *S. capitatus* is based directly on Linnaeus's, the application of Brown's name must be determined by the Clayton plant on which rests the name-bringing synonym of Linnaeus. The name ELEOCHARIS CAPITATA (L.) R. Br. must therefore now be restricted to the plant which has long been called *Eleocharis tenuis* (Willd.) Schultes.

2. *Scirpus autumnalis* L. Mant. ii. 180 (1771).¹ This species was based solely on Clayton 772, which, as well represented in the Linnaean Herbarium and the Clayton Herbarium, is the plant known in

¹ *Scirpus autumnalis*.

"SCIRPUS culmo ancipi nudo, umbella decomposita foliosa, spiculis ovatis.

"Scirpus foliosus pusillus autumnalis [sic], culmo plano utrinque paullum compresso. Clayt. 772.

"Habitat in Virginia.

"Facies Junci pilosi . . . &c."

recent years as *Fimbristylis Frankii* Steud. Syn. Pl. Cyp. 111 (1855), for which the name *F. geminata* (Nees) Kunth has been adopted in the second edition of Britton & Brown's Illustrated Flora (i. 322 (1913)). The name *FIMBRISTYLIS AUTUMNALIS* (L.) R. & S. Syst. ii. 97 (1817) must accordingly be transferred to this species. The form with contracted inflorescence, described by Prof. Fernald, *RHODORA* xi. 180 (1909), from Orono, Maine, under the name *F. Frankii* var. *brachyactis*, seems best treated as *F. AUTUMNALIS* (L.) R. & S. forma **brachyactis** (Fernald).

The plant now passing as *F. autumnalis* has received numerous names at different times under several genera, among which the oldest seems to be *Scirpus mucronulatus* Michx. Fl. i. 31 (1803). The types of this species in the Michaux Herbarium at Paris have obligingly been examined by M. Gadaceau of the Paris Herbarium and pronounced identical with material sent him of the southern species hitherto called *F. autumnalis*. The *F. autumnalis* of our present manuals must consequently become *FIMBRISTYLIS mucronulata* (Michx.).

The type of *Scirpus complanatus* Retz. (= *Fimbristylis complanata* (Retz.) Link), in the British Museum — a species sometimes synonymized with *F. autumnalis* of authors — represents a different species, with which *Harris* 11618 from Jamaica (in the British Museum) agrees very well; the type of *Cyperus amentaceus* Rudge, Pl. Guian. 16. t. 19 (1805 ?), is identical with it.

A considerable range extension of the true *F. autumnalis* (*i. e.*, *F. Frankii* Steud.) is indicated by some rather young plants in the British Museum from Nuttall, labelled "R[ocky] Mts.," which I am unable to distinguish from this species.

3. *Schoenus glomeratus* L. Sp. i. 44 (1753).¹ Examination of the extensive series representing *Rynchospora glomerata* (L.) Vahl and its so-called var. *paniculata* (Gray) Chapm. in the Gray Herbarium shows that the two are specifically distinct, as they were originally treated by Dr. Gray. The more northern plant, which has passed as true *glomerata*, has an achene 1.5 mm. long (including the crustaceous "perianth—

¹ *Schoenus glomeratus*.

"8. *SCHOENUS* culmo triquetro folioso, floribus fasciculatis, foliis planis, pedunculis lateralibus geminis.

"*Schoenus* culmo triquetro, pedunculis geminis lateralibus, floribus conglomeratis. *Gron.* *virg.* 131.

"*Habitat in Virginia.*"

base, but excluding the style) and 0.8 mm. wide, while in the more southern var. *paniculata* the achene is 2 by 1.5 mm. and much more umbonate. In the southern plant, moreover, the spikelet is usually 1-fruited, in the northern plant 2-3-fruited, as long ago noted by Kunth (Enum. ii. 296 (1837)) in describing the southern form as *R. glomerata* var. *robustior*. This difference in size and shape of achenes, which runs with great constancy through a series of more than 115 collections of the two plants, in combination with other differences in size of plant, breadth of leaf, looseness of inflorescence, and number of achenes in the spikelet fully confirms the specific distinctness of the two plants.

Both the specimen from Kalm in the Linnaean Herbarium, which has recently been re-examined for me through the kindness of Mr. B. Dayton Jackson, and the plant of Clayton (no. 585) on which the Gronovian citation is based, belong to the large-fruited southern plant which was named *Rhynchospora paniculata* by Gray in 1835, and has of late years been treated as a variety of *R. glomerata*. It will now be necessary to restrict the name RYNCHOSPORA GLOMERATA (L.) Vahl, Enum. ii. 234 (1805), to the large-fruited plant, Gray's *R. paniculata*, which as shown above deserves specific recognition. This species seems to have no noteworthy variations.

The first name which can be taken up for the more northern-ranging species which has passed as typical *R. glomerata* seems to be *Schoenus capitellatus* Michx. Fl. i. 36 (1803). Michaux's specimens were long ago identified by Dr. Gray (mss. notes in Gray Herb.) as "a state of *R. glomerata*,—from which the description is mostly drawn,—and a young *R. Elliottii*" (= *R. schoenoides* (Ell.) Wood). Wishing to secure more precise information as to these specimens, I sent specimens of *R. glomerata* (i. e., the plant so called in our manuals), *R. paniculata*, *R. schoenoides* (Curtiss 6625), and *R. axillaris* to Dr. H. Lecomte, director of the Paris Herbarium, with the request that they be compared with the material in the herbarium of Michaux. His assistant, M. Gadaceau, has kindly sent me the following notes on the material referred to *Schoenus capitellatus* in the herbaria of Michaux and of Drake del Castillo.

"1. Herbiers du Museum. Deux feuilles d'herbier. L'une comprend, comme l'indiquent les étiquettes au crayon signées A. Gray qui y sont jointes deux formes: *Rhynchospora glomerata* Vahl, *R. Elliottii* A. Gray. L'autre offre quatre beaux échantillons du *Rhyn-*

chospora glauca Vahl. Tous ces échantillons sont accompagnés d'une étiquette signée de Michaux, avec le nom de *Schoenus capitellatus*.

"2. Herbier Drake. Cet herbier contient quatre feuilles de plantes de Michaux (Herbarium Richard). 1. Étiquette *Schoenus fascicularis* signée Michaux — deux échantillons: l'un qui est bien le *Rhyn. fascicularis* Vahl, l'autre qui est le *R. Elliottii* A. Gray non Dietr. 2. Étiquette *Schoenus* (sans nom d'espèce) signée Michaux — C'est le *R. glomerata* Vahl! 3. Étiquette *Schoenus capitulatus* (*sic*) signée Michaux avec l'annotation: 'Setulae retrorsum muricatulae! an *S. glomeratus*? Walth.— Caroline.' Ces échantillons ont été rapportés, avec raison, par Richard (Achille, non Louis Claude) au *R. glauca* Vahl. 4. Deux échantillons étiquette *Schoenus distans*, signée Michaux, avec l'annotation 'S. glomeratus L.? Caroline'. Ces échantillons ont été rapportés, avec raison, par Richard (Achille) au *Rhync. glomerata* Vahl.

"Résumé — Nos plantes de Michaux étiquetées *Schoenus capitellatus* correspondent aux *Rhync. glomerata* Vahl.; *R. Elliottii* A. Gray non Dietr.; *R. glauca* Vahl."

Although, as will be seen from the above, the status of Michaux's specimens is even more confused than was indicated by Dr. Gray, it seems best to avoid the creation of a new name for the species by adopting Michaux's *S. capitellatus* and typifying it by the undoubted specimen of *R. "glomerata"* in the Michaux Herbarium. The species called *Rynchospora glomerata* in our current manuals then becomes RYNCHOSPORA CAPITELLATA (Michx.) Vahl, Enum. ii. 235 (1805).

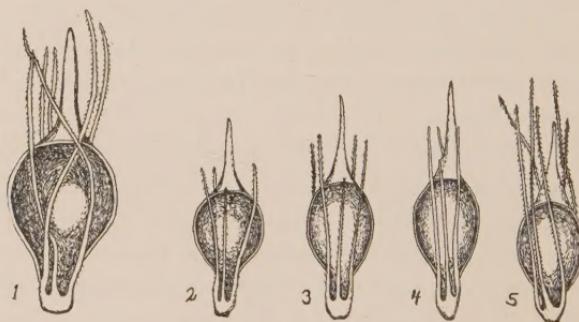
Rynchospora capitellata is a somewhat variable species. The great bulk of the material examined, from Maine and Ontario to Florida and Missouri, has the bristles of the perianth densely and retrorsely barbed. For this, the typical form of the species, the earliest varietal name is *R. glomerata* var. *minor* Britton, based on starved and depauperate specimens from the White Mountains not otherwise differing from the typical form of the species. Another plant, collected by E. B. Bartram in Pennsylvania and by Shull in Maryland, is peculiar in its upwardly barbed bristles. Two sheets, from North Carolina and Indiana, represent the *R. glomerata* var. *discutiens* of C. B. Clarke, characterized by its smooth bristles. All three of these forms have the achene contracted into a rather long stipitiform base. In the *R. glomerata* var. *leptocarpa* of Chapman, from Virginia to Florida

and Mississippi, the achene is provided with a much shorter and more abrupt base. These forms may be defined as follows.

RYNCHOSPORA CAPITELLATA (Michx.) Vahl var. **minor** (Britton) (typical form).—*Rynchospora glomerata* var. *minor* Britton! Trans. N. Y. Acad. Sci. xi. 89 (1892), also as Contr. Columb. Coll. No. 26. 15.—Aristae retrorsum barbatae.—The common form, from Me. and Ont. to Fla. and Mo.—Fig. 2.

Var. **controversa**.—Aristae prorsum barbatae.—PENNSYLVANIA: moist meadow, Frazer, Chester Co., 14 Aug. 1910, E. B. Bartram 1129 in part (TYPE in Gray Herb.). MARYLAND: on bank, south of Havre de Grâce Park, Chesapeake Bay region, 28 July 1902, G. H. Shull 129.—Fig. 3.

Var. **discutiens** (Clarke).—*Rynchospora glomerata* var. *discutiens*



Figs. 1-5.—Fig. 1. *Rynchospora glomerata* (L.) Vahl (Curtiss 5739, Florida). Fig. 2. *R. capitellata* (Michx.) Vahl var. *minor* (Britton) Blake (Gray, N. Am. Gram. &c. Exs. 94). Fig. 3. *R. capitellata* var. *controversa* Blake (Bartram 1129 p. p.). Fig. 4. *R. capitellata* var. *discutiens* (Clarke) Blake (Buckley). Fig. 5. *R. capitellata* var. *leptocarpa* (Chapm.) Blake (Curtiss 5926).—All $\times 10$.

Clarke! in Britton, Trans. N. Y. Acad. Sci. xi. 89 (1892).—Aristae laeves vel ut dicitur apice barbatae.—NORTH CAROLINA: mountains, Buckley (COTYPE COLL.). INDIANA: sterile damp places, Millers, 28 Aug. 1908, L. M. Umbach (in A. Kneucker, Cyp. &c. Exsicc. no. 184).—Fig. 4.

Var. **leptocarpa** (Chapm.)—*Rynchospora glomerata* var. *leptocarpa* Chapm. in Britton, Trans. N. Y. Acad. Sci. xi. 88 (1892).—Achenium breve basi abrupte breviterque stipitatum; aristae retrorsum barbatae.—SOUTH CAROLINA: Aiken, July 1866, Ravenel. FLORIDA: near De Funick Springs, 6 July 1897, Curtiss 5926. MISSISSIPPI: Saratoga, 3 Aug. 1903, Tracy 8616.—Fig. 5.

The achene of *R. glomerata* (L.) Vahl (*R. paniculata* Gray) is shown for comparison in fig. 1.

(To be continued.)

GRAY HERBARIUM.

SOME AMERICAN EPILOBIUMS OF THE SECTION LYSIMACHION.

M. L. FERNALD.

I. AN INSULAR VARIETY OF EPILOBIUM · DENSUM.

EPILOBIUM DENSUM Raf., var. **nesophilum**, n. var., caulis sub-simplicibus vel superne ramosis; foliis primariis lanceolatis 3–6 mm. latis; calycibus 4.5–7 mm. longis, lobis obtusis vel obsolete mucronatis; petalis 7.5–10 mm. longis.

Stems subsimple or branching above: leaves lanceolate; the primary 3–6 mm. broad: calyx 4.5–7 mm. long; the lobes obtusish or obscurely mucronate: petals 7.5–10 mm. long.—NEWFOUNDLAND: Bally Haley Bog, St. John's, August 6, 1894, Robinson & Schrenk; boggy open woods, Whitbourne, August 8, 1911, Fernald & Wiegand, no. 5,913; boggy thickets, Bishop Falls, July 28 and 29, 1911, Fernald & Wiegand, no. 5,910. MAGDALEN ISLANDS: boggy margin of a brackish pond southwest of Étang du Nord Village, Grindstone Island, August 15, 1912, Fernald, Long & St. John, no. 7,809; larch swamp, Grindstone, July 23, 1912, Fernald, Bartram, Long & St. John, no. 7,813; wet woods and thickets at the border of a larch swamp, Grindstone, August 13, 1912, Fernald, Long & St. John, no. 7,816 (TYPE in herb. Gray); dune hollow, Brion Island, August 9, 1914, St. John, no. 1,935.

This insular extreme of *Epilobium densum* differs markedly from the typical form of the species, which occurs from the west side of the Gulf of St. Lawrence westward and southward, in its very large flowers and in the unusually broad leaves, as well as in the less branched habit. In true *E. densum* of the continent and of Prince Edward Island the leaves are commonly narrower, the plant ordinarily more bushy-branched and the calyx 3–4.3 mm. long, the petals 4.2–6.5 mm. long. In the subsimple habit and broad leaves, as well as in the larger flowers, *E. densum*, var. *nesophilum* strongly simulates some forms of *E. palustre*, but it has the erect buds and the seeds as well as the closely canescent upper surfaces of the leaves of the more southern species. The calyx-lobes are, in their barely mucronate tips, intermediate between those of the two species, the calyx-lobes of *E. densum* being usually definitely mucronate, those of *E. palustre* merely blunt. In view of the very extensive collections made upon the Magdalen Islands and Newfoundland and the fact that no typical *E. densum* has been

found in either of these insular areas, it is not probable that the somewhat intermediate plant which simulates *E. palustre* but has the technical characteristics of *E. densum* can be treated as of hybrid origin. It seems rather to be an insular variant derived, like so many plants of the Magdalen Islands and Newfoundland, from the south but by long isolation modified into a well pronounced geographic variety.

II. THE SABLE ISLAND EPILOBIUM.

THE only *Epilobium* known from Sable Island, 100 miles off the coast of Nova Scotia, is a plant collected in 1899 by Professor John Macoun and in 1913 secured in quantity by Dr. Harold St. John; and from the observations of both these explorers apparently the only member of the genus on the island. The plant in habit, outline of foliage, and large flowers, as well as in the characters of its calyx and seeds, exactly matches the common *E. molle* Torr. of the mainland, while the capsules have the peculiar glandular pubescence which is found upon the capsules of *E. molle*, but in the Sable Island plant much more highly developed than is common in mainland specimens. The stems and the leaves of the Sable Island plant, however, are densely cinereous with appressed and incurved hairs, exactly as in *E. densum* Raf.; *E. molle* having the stems, leaves, etc., densely covered with fine, straight and conspicuously spreading pubescence.

This Sable Island plant with the technical characters of calyx, petals, etc., and the glandular pubescence of the capsule, and the exact habit and leaf-outline of *E. molle*, but with the pubescence of the leaves and stems exactly as in *E. densum* would, if found upon the mainland, be promptly called a hybrid between those two species. But neither of the species has been detected on Sable Island, a region of sufficiently limited area to give assurance that the extended explorations of Macoun in 1899, of Güssow in 1911, and of St. John in 1913, when the latter explorer spent four weeks in an intensive study of the flora, would have brought to light any other existing member of the genus. Upon Sable Island, then, this plant, combining the characters of two ordinarily distinct species of the mainland, cannot be accepted as a hybrid, at least of modern origin. There is, moreover, reason to believe that the flora of Sable Island reached that area during the late Pleistocene and has been isolated from the mainland flora since that time. However long this period may have been, whether estimated

by thousands or tens of thousands of years, it has certainly been a sufficient time for the Sable Island plant to have become thoroughly fixed in its characters, and even if, many thousands of years ago, it may have originated as a hybrid, it has upon Sable Island intensified its characters and become a thoroughly constant plant.

The case of this plant is exactly comparable with that of *E. densum*, var. *nesophilum*, discussed in this paper, the peculiar variant of *E. densum* found upon Newfoundland and the Magdalen Islands, where no true *E. densum* is found, but in those areas suggesting that it might have originated in the long-distant past by the hybridization of *E. densum* of the South and *E. palustre* of the North. Whether these plants have had such an origin is entirely problematical and it may as confidently be argued that they are local developments, which by insular isolation have become fixed entities, and are really the result of natural selection. Whatever the origin of these plants may be, they are now absolutely definite and consistent, and the Sable Island plant is here proposed as

E. MOLLE Torr., var. **sabulonense**, n. var., habitu foliisque ut apud formam typicam; caulibus foliisque dense cinereo-pilosus, pilis adpressis incurvatis; capsulis cinereo-pilosus valde glandulosus.

Habit and foliage as in the typical form: stems and leaves densely cinereous-pilose with appressed incurved hairs: capsules cinereous-pilose, copiously glandular.—NOVA SCOTIA: swampy edge of fresh water pond at Life Saving Station No. 3, Sable Island, September 9, 1913, Harold St. John, no. 1282 (TYPE in Gray Herb.); Dr. St. John has examined material collected at the same station in 1899 by Prof. John Macoun (no. 21,189).

III. EPILOBIUM GLANDULOSUM AND E. ADENOCAULON.

Epilobium glandulosum Lehm.¹ has long been a somewhat baffling species to interpret, chiefly because of the small amount of material in American herbaria. Haussknecht² in his Monograph took up this species and recognized it from the Bering Sea region southward to California and New Mexico and southwestward to Japan, also from Labrador, Newfoundland and Quebec and the Carolina Mountains. Trelease³ restricted the species to Alaska and northwestern Asia but said "Forms too near this also in British Columbia" and "young specimens

¹ Lehm. Pug. ii. 14 (1830); Hook. Fl. Bor.-Am. i. 206 (1833).

² Haussk., Mon. Gatt. Epil. 273 (1884).

³ Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 99 (1891).

doubtfully referred here occur in the Gray Herbarium from Labrador."¹ Subsequent authors have been inclined to treat *E. glandulosum* as an obscure plant and not to recognize it as a broadly distributed northern species. In the meantime the vast accumulations of *Epilobium* of the general affinity with *E. glandulosum* have found their way chiefly into the covers of *E. adenocaulon* Haussk.¹

About the Gulf of St. Lawrence and on the shores of the Straits of Belle Isle and the coast of eastern Labrador there is a large-flowered *Epilobium* with petals 7–9 mm. long, the pubescence as in *E. adenocaulon*, the leaves of similar outline, but much more crowded, and not conspicuously decreasing in size into the inflorescence. The stem is comparatively simple, the branches being few and very short. This plant, long familiar to the writer from the coast of the Gaspé Peninsula of Quebec, the Straits of Belle Isle and Newfoundland, exactly matches the Alaskan material of undoubted *E. glandulosum*, as well as the plate of that species published by Léveillé.² In the Gulf of St. Lawrence region, however, many plants occur with the lax habit and more reduced upper leaves of *E. adenocaulon*, but with the flowers quite as large as in *E. glandulosum*, while other specimens with the habit of *E. glandulosum* have the smaller flowers of *E. adenocaulon*. That the two species there freely intergrade cannot be questioned; but it is significant that all the material from the colder habitats, the Labrador coast, the outer coast of Gaspé, etc., are fairly consistent and perfectly characteristic *E. glandulosum*. Reference has already been made to Prof. Trelease's statement that in the Northwest forms in British Columbia are "too near" *E. glandulosum*. Herbarium material shows that this is certainly the case and that in the Northwest as well as in the Northeast the two are confluent. Examination of the seeds of characteristic material of both plants fails to reveal any distinctive character, although the seed of *E. glandulosum* is very slightly longer than that of *E. adenocaulon*.

On the whole, the writer is forced to the conclusion that these plants should be treated as one species, a conclusion already suggested by Dr. Britton, who treats *E. glandulosum* as doubtfully distinct from *E. adenocaulon*.³ As geographic varieties, however, the plants are well pronounced and their treatment as such seems to the writer

¹ Haussk. Oesterr. Bot. Zeitschr. xxix. 119 (1879).

² Léveillé, Icon. Gen. Epil. t. 164 (1910).

³ Britton in Britton & Brown, Ill. Fl. ii. 484 (1897).

more satisfactory than to attempt to keep them apart as species on inconstant characters.

The plant which has passed as *E. adenocaulon* is extremely variable and the two varieties proposed by Prof. Trelease are fairly pronounced. The most extreme of these is his var. *perplexans*, in which the leaves are narrowed gradually to slender petioles. This plant often looks like a thoroughly distinct species but it has no constant characters by which it can be clearly separated. It is found locally from Newfoundland across the continent to Washington and southward across New England and New York, and in the Rocky Mountains to Colorado. The other variety, var. *occidentale*, is in some ways less pronounced but in its narrow lanceolate stem-leaves is fairly recognizable as distinct from true *E. adenocaulon*, in which the median leaves are from narrowly ovate to ovate-lanceolate. This variety is not confined to western America, however, but extends eastward to Ontario and northern New York and is also found, like many other northwestern plants, about the Gulf of St. Lawrence, in northern New England and in Newfoundland. Its lanceolate leaves somewhat suggest those of *E. coloratum*, but the coma of the fruit is quite white instead of cinnamon-colored as in the latter species, and it has the characteristic seed of *E. glandulosum*. Flowering material has been much confused with *E. coloratum*, as indicated by the labels; but the fully grown bud of *E. coloratum* has uncinate short tips (the appendages of the calyx-lobes), while the buds and calyx-lobes of *E. glandulosum* are blunt.

Two other extreme variations of *Epilobium glandulosum* occur in Labrador, Newfoundland and eastern Quebec. The more widely spread of these is a plant of southern Labrador, Newfoundland and the Gaspé Peninsula with the tall habit, loose inflorescences and reduced bracteal leaves of *E. adenocaulon* but with the middle cauline leaves cordate-attenuate, the base being conspicuously cordate. This may prove to be *E. boreale* Haussk., described from plants raised at Berlin from Alaskan seeds, a species not well understood by American botanists. The illustration published by Léveillé¹ of the summit of a specimen at Berlin strongly suggests the summit of the Labrador, Newfoundland and Gaspé plant; but in his original description Haussknecht clearly described the median cauline leaves as being “basi-

¹ Léveillé, Icon. Gen. Epil. pl. 162 (1910).

subrotundatis brevissime petiolatis, oblongo-lanceolatis acutis." ¹ This description would hardly have been given for the median leaves of the northeastern plant, which, as stated, are conspicuously cordate; and the plant is therefore here proposed as a new variety of *E. glandulosum*.

The other unique variant from the Gulf of St. Lawrence region is the plant of Brion Island, the outermost of the Magdalen Islands. In this variation the leaves are very unlike those of the variety just discussed as also the other described varieties, in all of which the leaves taper to an acute to acuminate apex. In the Brion Island plant, however, the median leaves are elliptic-oblong to oblong-lanceolate and rounded at summit; but in its essential characters, of seeds, pubescence, and habit the plant belongs with *E. glandulosum* and *E. adenocaulon*.

Briefly summarized the varieties of *E. glandulosum* may be characterized as follows:

- A. Flowers 6-9 mm. long: leaves crowded, not conspicuously decreasing in size into the crowded inflorescence..... Var. *typicum*.
- A. Flowers 4-8 mm. long: leaves remote, conspicuously decreasing in size into the loose and open inflorescence. *B.*
 - B. Median caudine leaves cordate-attenuate, ovate, conspicuously cordate at base..... Var. *cardiophyllum*.
 - B. Median leaves ovate-lanceolate to narrowly lanceolate or oblong, rounded, barely subcordate or narrowed at base. *C.*
 - C. Leaves firm, rounded or barely subcordate at base, with very short petioles: stems (except in dwarf plants) freely branching, up to 1.3 m. high. *D.*
 - D. Leaves narrowly ovate to lanceolate, acuminate or at least acutish. Median leaves narrowly ovate or ovate-lanceolate.
 - Var. *adenocaulon*.
Median leaves elongate-lanceolate..... Var. *occidentale*.
 - D. Leaves elliptic-oblong to oblong-lanceolate, rounded at summit.
Var. *brionense*.
 - C. Leaves thin and rather flaccid, tapering at base to the rather slender petiole: stems simple to slightly branching, 0.2-3 (rarely -4.5) dm. high..... Var. *perplexans*.
 - E. GLANDULOSUM, var. *typicum*. *E. glandulosum* Lehm. Pugill. ii. 14 (1830); Hook. Fl. Bor.-Am. i. 206 (1833); Haussk. Mon. Gatt. Epil. 273 (1884); Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 99 (1891); Léveillé; Icon. Gen. Epil. t. 164 (1910). *E. montanum* La Pylaie, Voyage à l'île de Terre Neuve, 78 (1825); Haussk. I. c. 76 (1884) as to Labrador plant, not L.—Coasts of Bering Sea, southward to Japan and Washington and in the mountains to Oregon; coasts of Labrador and Newfoundland, and Saguenay and Gaspé Counties, Quebec.

¹ Haussk. Mon. Gatt. Epil. 279 (1884).

In its large corolla and in its habit var. *typicum* closely simulates the European *E. montanum* L. from which it differs, however, in its shorter-pedicled capsules and its less saliently toothed and less cordate leaves; and it was unquestionably this plant which La Paylaie saw on the shores of Quirpon Island in northeastern Newfoundland and recorded as *E. montanum*. It is also highly probable that this is the plant which forms the basis of Haussknecht's report of *E. montanum* from Nain, Labrador.

E. GLANDULOSUM, var. **cardiophyllum**, n. var., var. *adenocaulo* habitu simile: foliis intermediis cordato-ovatis attenuatis basi valde cordatis 6–10 cm. longis 2.5–4 cm. latis; floribus 5–8 mm. longis.

Similar in habit to var. *adenocaulon*: median leaves cordate-ovate, attenuate, conspicuously cordate at base, 6–10 cm. long, 2.5–4 cm. wide: flowers 5–8 mm. long.—LABRADOR: limestone and calcareous sandstone terraces, Blanc Sablon, August 6, 1910, *Fernald & Wiegand*, no. 3731. NEWFOUNDLAND: rocky banks of Rennie's River, St. John's, August 4, 1894, *Robinson & Schrenk*, no. 195; sandy and gravelly banks of Waterford River between Waterford Bridge and St. John's, August 2, 1911, *Fernald & Wiegand*, no. 5926; wood-road, Port Saunders, August, 1910, *Fernald, Wiegand & Kittredge*, no. 3732; calcareous talus, bank of Humber River, between Mt. Musgrave and Humber Mouth, July 18, 1910, *Fernald, Wiegand & Kittredge*, no. 3729. QUEBEC: coniferous forest, "Low's Trail," from the Forks of the River Ste. Anne des Monts to Table-top Mountain, July 31, 1906, *Fernald & Collins*, no. 661 (TYPE in Gray Herb.).

E. GLANDULOSUM, var. **adenocaulon** (Haussk.), n. comb. *E. adenocaulon* Haussk. Oesterr. Bot. Zeitschr. xxix. 119 (1879).

E. glandulosum, var. **occidentale** (Trelease), n. comb. *E. adenocaulon*, var. *occidentale* Trelease, Mo. Bot. Gard. 2nd. Ann. Rep. 95 (1891). *E. occidentale* Rydberg, Mem. N. Y. Bot. Gard. i. 275 (1900).

E. GLANDULOSUM, var. **perplexans** (Trelease), n. comb. *E. adenocaulon*, var. ? *perplexans* Trelease l. c. 96 (1891). *E. perplexans* Coulter & Nels. Man. Bot. Rocky Mts. 337 (1909).

E. GLANDULOSUM, var. **brionense**, n. var., var. *adenocaulo* habitu simile; caulis 3–4 dm. altis simplicibus vel ramosis: foliis primariis elliptico-oblongis vel oblongo-lanceolatis apice basique rotundatis subsessilibus 3–4.5 cm. longis 1.1–1.6 cm. latis; floribus 7 mm. longis.

Similar in habit to var. *adenocaulon*: stems 3–4 dm. high, simple or branching: primary leaves elliptic-oblong or oblong-lanceolate, rounded to base and apex, subsessile, 3–4.5 cm. long, 1.1–1.6 cm. wide: flowers 7 mm. long.—MAGDALEN ISLANDS: edge of pond in sand dunes, Brion Island, August 6, 1914, *Harold St. John*, no. 1938 (TYPE in Gray Herb.).

IV. EPILOBIUM ALPINUM AND ITS ALLIES IN NORTHEASTERN AMERICA.

The name *Epilobium alpinum* has been so variously used that by some authors, such as Haussknecht, it has been felt wise to discard it entirely as a source of perpetual confusion. Trelease,¹ however, because of the presence among the mixed specimens called *E. alpinum* in the Linnean herbarium of typical *E. lactiflorum* Hausskn., felt that the doctrine of residues should be applied and that, all the other elements of the mixed Linnean species having been long ago removed, the residual *E. lactiflorum* should be called *E. alpinum*. On the other hand, Mr. A. H. Moore² has recently argued at length that the name *E. alpinum* must be applied to *E. Hornemannii* Reichenbach. Mr. Moore makes at least a fairly clear point that *E. alpinum* rested upon plants with pink flowers, and it is certainly reasonably definite that Linnaeus had in mind both the pink-flowered plants subsequently described as *E. anagallidifolium* Lam. and *E. alsinefolium* Vill. But the remainder of Moore's argument, that *E. Hornemannii* Reichenb. must be called *E. alpinum*, is less convincing and in view of the great difficulty of this question and the lack of finality in some of Moore's arguments, it does not seem wise to drop the definite name *E. Hornemannii* and to take up for it the obscure and variously interpreted name, *E. alpinum*. *E. Hornemannii* is an arctic-alpine species known in Europe only from Norway and Sweden. Yet Moore urges that it is the true Linnean *E. alpinum*, and supports his argument in part by stating that "this was apparently the older view," citing in his evidence "Sowerby's English Botany, xxvii. pl. 2001 (1819), for example." In citing Sowerby's plate of *E. alpinum* as representing *E. Hornemannii*, Moore, however, apparently overlooks the pertinent fact that *E. Hornemannii* is unknown from Great Britain. He also infers that Haller's *Epilobium foliis ellipticis, obtuse lanceolatis* from Switzerland is *E. Hornemannii*; in this inference also failing to give great weight to the fact that *E. Hornemannii* does not occur south of Scandinavia. For similar reasons Scheuchzer's *Chamaenerium alpinum alsines foliis* from Switzerland, the reference given by Linnaeus from which the name-bringing adjective *alpinum* seems to have been derived, cannot be identified with the Scandinavian *E. Hornemannii*.

¹ Trel., Mo. Bot. Gard. 2d Ann. Rep. 108 (1891).

² RHODORA, xi. 144-147 (1909).

The overwhelming weight of opinion among post-Linnean botanists has been that the name *E. alpinum* belongs properly to *E. anagallidifolium* Lam. Haussknecht cites no less than 125 European authors who have so treated the plant, and, since Haussknecht's own work, such critical students of the European flora as Britten & Rendle and Druce have clearly designated *E. alpinum* as signifying *E. anagallidifolium*. In view of this great weight of authoritative usage and the difficulty of proving clearly that the name *E. alpinum* applies more definitely to any other plant, we may well retain it in its long established sense for *E. anagallidifolium*, thus subscribing to one of the general principles (Art. v.) of the International Rules of Botanical Nomenclature that "when the consequences of rules are doubtful, established custom becomes law."

Moore, in the same paper in which he would identify *E. Hornemannii* as the Linnean *E. alpinum*, states that the seeds of *E. Hornemannii* and *E. lactiflorum* "do not differ in any respect" (p. 142), arguing that Haussknecht could not have seen the seeds correctly. Nevertheless, examination of seeds from every mature sheet in the Gray Herbarium of these species shows conclusively that when seen against strong illumination the margin of the seed of *E. lactiflorum* appears very regular and smooth while the profile of the seed of *E. Hornemannii* is distinctly pebbled or, as Haussknecht says, "papillose." Only in the very rarest instances, and then in regions where both species abound, has there been any question in placing the plants in two definite species, one with the seeds smooth, the other with pebbled seeds. Furthermore, all the material from Scandinavia, Greenland, Arctic America, and the region southward to the Shickshock Mountains and the White Mountains with the smooth seed of *E. lactiflorum* has the petals distinctly milk-white, as described by Haussknecht, or at most with a tinge of light pink, and in all these plants the expanded flowers (in dried condition) measure 3–5 (very rarely –6) mm. long. On the other hand, the material of *E. Hornemannii*, the species with pebbled seeds, has the expanded flowers 5–10 mm. long, the petals (except in rare albinos) lilac to rose-purple. The writer is therefore constrained to regard the two, as was done by Haussknecht, by Trelease, and by numerous later students, as clearly distinct species and not, as Moore argues, merely color forms with no other differences except the color of the petals.

Besides *E. alpinum* (*E. anagallidifolium*), which occurs southward to

the Shickshock Mountains of Quebec and apparently to Mt. Katahdin, Maine (specimens young), *E. Hornemannii* and *E. lactiflorum*, there is in eastern America one other clearly marked species which seems not to have been described. This is a plant occurring in the Torngat Mountain region of northeastern Labrador and represented in the Gray Herbarium by two collections made by the Rev. Adolph Stecker of the *Unitas Fratrum*. This plant of the Torngat Mountain area has the cespitose habit of the other species, but is more stiffly erect and with sub-coriaceous or almost rigid, crowded sessile leaves, these occurring as 9–12 pairs below the lowest flower; the other species of eastern America having the 3–7 pairs of thin foliage leaves distinctly petioled. The flowers are small, with whitish petals, as in *E. lactiflorum*, but the young buds and young capsules are strictly erect instead of nodding, as in that and in the other related species; while the capsule is very short-pedicelled, the pedicel only 2–4 mm. long, *E. lactiflorum*, having the pedicels well developed, often 2 or 3 cm. long, as do both *E. Hornemannii* and *E. alpinum*. The mature capsules of the new plant are 3.5–4 cm. long, those of *E. lactiflorum* and of *E. Hornemannii* being usually longer (3–6 cm.). The seed is essentially that of *E. Hornemannii*, being fusiform and with a pebbled surface. In its stiff habit and crowded leaves the new plant resembles *E. Bongardi* Haussk. of the Bering Sea region, but the latter species has more oval leaves, much larger flowers (6–10 mm. long) with conspicuous crimson petals, the capsules are long-pedicelled (often 2 cm. long), and the seed is quite smooth, as in *E. lactiflorum*.

The Labrador plant, differing in its essential characters from all the described northern species, may appropriately bear the name of the assiduous collector, Rev. Adolph Stecker, who has supplied us with material of so many interesting and often novel plants from northeastern Labrador. The species is therefore described as

EPILOBIUM Steckerianum, n. sp., *E. lactifloro* habitu floreque simile; caulibus stricte erectis; foliis subcoriaceis confertis 9–12 jugis infra inflorescentiam oblongo-lanceolatis 1.5–3.5 cm. longis 0.5–1 cm. latis obtusis repando-denticulatis sessilibus vel subsessilibus; floribus 4–6, virgineis erectis 4.5–5.5 mm. longis; calycibus 3.5–5 mm. longis glabratris; petalis lacteis; capsulis breviter pedicellatis, junioribus erectis glanduloso-hirtellis, adultis glabratris 3.5–4 cm. longis, pedicellis 2–4 mm. longis; seminibus fusiformibus, apice in appendiculum pellucidum productis 1.3 mm. longis 0.4 mm. latis, testa papilloso-rugulosis.

Similar to *E. lactiflorum* in habit and flowers, but stiffly erect: the

leaves subcoriaceous, crowded, 9–12 pairs below the inflorescence (members of the upper pairs sometimes disjoined), oblong-lanceolate, 1.5–3.5 cm. long, 0.5–1 cm. broad, obtuse, repand-denticulate, sessile or subsessile: flowers 4–6; the young erect, 4.5–5.5 mm. long: calyx 3.5–5 mm. long, glabrate: petals milk-white: capsules short-pedalled; the young erect, glandular-hirtellous; the mature glabrate, 3.5–4 cm. long; pedicels 2–4 mm. long: seeds fusiform, produced at apex into a pellucid appendage, 1.3 mm. long, 0.4 mm. broad; the testa papillose-rugulose.—LABRADOR: Rama, July 15–August 20, 1894, A. Stecker, no. 90, distributed as *E. Hornemannii*; Rama, July–August, 1899, A. Stecker, no. 360 (TYPE in Gray Herb.), distributed as *E. Hornemannii*.

GRAY HERBARIUM.

NUTTALL AND PICKERING IN THE WHITE MOUNTAINS.—In a recent article on early botanical explorations in the White Mountains¹ I stated that the date of Mr. Nuttall's visit to the White Mountains was not known, but suggested that it may have fallen between the years 1822 and 1824. This trip was of significance because upon it, according to Tuckerman,² "the practised eye of Mr. Nuttall had detected several species, of such rarity, that few have seen them since." But after the article in *Appalachia* was published, Dr. Frederick Tuckerman examined the old hotel-register or 'visitors' album' of Ethan Crawford,³ and he has kindly communicated to me this entry under date of 12 August, 1824: "Thos. Nuttall

Jas. Whitfield

Cambridge,

Mass."

The collections of Charles Pickering on Mt. Washington in 1825 are amply attested,⁴ but evidence was hitherto lacking for any subsequent visit by him. The same register, however, records the names of Oakes and Pickering on 18 July and of Pickering again on 22 July, without mention of the year. But since the preceding page of the register is dated 1827 that is probably the date of this trip.—ARTHUR STANLEY PEASE, Urbana, Illinois.

¹ *Appalachia* 14 (1917), 167.

² In T. S. King's *White Hills*, 1st ed. (1860), 46.

³ Now in the possession of his only surviving child, Mr. W. H. Crawford, of Jefferson, N. H.

⁴ *Appalachia* 14 (1917), 166.

A FURTHER NOTE ON THE LICHENS OF NANTUCKET.—I spent last summer from June 25 to August 7, 1917, at Nantucket, Mass., and during my stay collected the following species of lichens additional to those included in my two previous lists (RHODORA 14:88-90. 1912. & 15:93-94. 1913).

Usnea plicata (L.) Web. Depauperate on fence rails.

Ramalina fasciata (Pers.) Ach. emend. On trees.

Cetraria tenuifolia (Retz.) Howe. One station.

Physcia stellaris (L.) Nyl. On locusts.

Nephromopsis ciliaris (Ach.) Hue. On old fence rails.

Parmeliopsis aleurites (Ach.) Nyl. On old fence rails.

Lecanora varia (Ehrh.) Nyl. On trees.

Specimens of most of the species known from this island are now on exhibition in the rooms of the Maria Mitchell Association.—R. HEBER HOWE, JR., Thoreau Museum, Concord, Massachusetts.

Vol. 20, no. 229, including pages 1 to 20, was issued 25 January, 1918.

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